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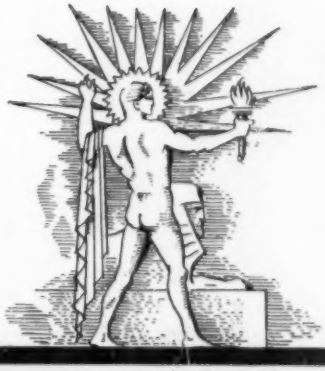
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •



November 26, 1938

Apartment Size

See Page 343

A SCIENCE SERVICE PUBLICATION

Do You Know?

Discovery of helium gas is reported in Sao Paulo province, Brazil.

For highway center lines, neon lights under glass brick have been suggested.

There are better maps of some parts of the moon than of some parts of the earth.

Crudely worked stones found in the Malay Peninsula are pronounced the first Old Stone Age tools ever found there.

Office workers have nine times as many colds as policemen or other outdoor workers, says Dr. J. N. Fishbein in *Hygeia*.

A stand of spruce trees resistant to the spruce gall aphid has been grown at the Connecticut Agricultural Experiment Station.

A borax and boric acid solution in water is found effective to fireproof curtains and other household fabrics, and to protect them from sulfur gas injury.

To commemorate the fortieth anniversary of the discovery of radium, France has issued a special postage stamp showing portraits of Pierre and Marie Curie.

Guatemala's beautiful national bird, the green and crimson quetzel, has a tail about three feet long, which adds to the bird's beauty but is probably a handicap in flying.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER *are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.*

ARCHAEOLOGY

What great hero of mythology lost dignity and became a comedian? p. 345.

ASTRONOMY

What great scientific discovery was made by a court reporter? p. 346.

ENGINEERING

How are ancient bricks better than modern ones? p. 344.

GENETICS

What is the stuff of heredity worth per gram? p. 341.

MEDICINE

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What is the cure for pellagra? p. 348.

PHYSICS

How can fire be made from water? p. 344.

What are the achievements of the new winner of the Nobel physics prize? p. 341.

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POPULATION

How much carbon dioxide does man exhale from his lungs and from his chimneys? p. 339.

Why do women sometimes remain childless? p. 339.

PSYCHIATRY

What physical basis have the imaginary voices heard by some mental patients? p. 345.

PSYCHOLOGY—MEDICINE

How can brain waves aid in the battle against drug addiction? p. 342.

RADIO

What prevents the use of ultra short radio waves for secret wartime signalling? p. 351.

SOCIOLOGY

Does smoking marihuana improve the playing of swing? p. 340.

SURGERY

How many surgical operations does America undergo in a year? p. 342.

ZOOLOGY—PHYSICS

How many species of wildlife has America lost through extinction? p. 343.

The X-disease is a new menace to peach trees, spreading in Connecticut and New York.

American workers are better protected against eye hazards than Europeans, yet in the United States eye accidents cost industry $50,000,000 a year.

Chemically treated cones that lend rainbow colors to hearth fires are produced by the following chemicals: copper sulfate for bluish green flame, strontium chloride for red, copper chloride for turquoise, calcium chloride for orange, potassium chloride for purple.

The world's largest welded ships are two tankers that weigh 18,500 tons each.

Chain mail coats strikingly like those of medieval knights are worn by some African natives in the Cameroons.

About 2800 B. C., there were great cities in Egypt and Mesopotamia, while archaeological evidence indicates that in widening circles were people of less advanced culture: villagers in central Europe used metal, but only for weapons and ornaments; while still farther north in Europe men were still in the Stone Age.

SCIENCE NEWS LETTER

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POPULATION

Man Must Learn Wisdom in Use of Borrowed Powers

American Philosophical Society in Special Population Session Considers Motives Behind Family Limitation

UNLESS man can learn wisdom to match his cleverness in harnessing the forces of nature to his own ends, he is in for major trouble. Such was the warning given to the American Philosophical Society, by Dr. Alfred J. Lotka, president of the Population Association of America.

Dr. Lotka pointed out that of all animals man is the only one that has been able to harness natural forces on a large scale to increase the power of his own muscles and personal internal chemistry. He used a unique means for measuring this artificial increase of man's physical powers: the amount of carbon dioxide discharged respectively from our own breath and from our chimneys. We breathe into the atmosphere about half a billion tons of this gas a year; in the same period our chimneys belch forth some three billion tons.

Since man's requirements for just staying alive are relatively inelastic, this great expansion in his productivity has gone largely into providing conveniences, luxuries and leisure.

"This in itself would be no hardship," commented Dr. Lotka, "if in times when such a situation arises, the relative leisure thereby occasioned were evenly distributed. Actually, we know only too well that such even distribution does not take place, that the result is a state of affairs when a section is busy and another section is idle."

Greater Problem

Man's maldistribution of goods and leisure, however, presents far less of a problem than does his recently discovered ability to control his own rate of reproduction, in Dr. Lotka's opinion.

"Once reproduction is brought under arbitrary control," he said, "superlative importance is lent to the desire for progeny. Statistics, correctly interpreted, show only too plainly that in this most important of all adaptive urges, modern civilized populations are deficient. And there are other maladjustments of human aims and endeavors, which, in the present state of man's powers, destructive as well as constructive, threaten to rock the very foundations of civilized humanity."

How to induce human beings to use wisdom in the application of the vastly extended physical powers they have won, Dr. Lotka admitted to be an exceedingly difficult problem. Knowledge depending on the senses is easily passed on and desires originating in the senses are easily understood and satisfied. But matters of taste are not so easily transferable. Dr. Lotka hinted at the possibility of chemical control of mass reactions through the use of beneficent drugs, but he did not develop this point. A second means of control which he suggested is through mass suggestion.

Riddle of the Sphinx?

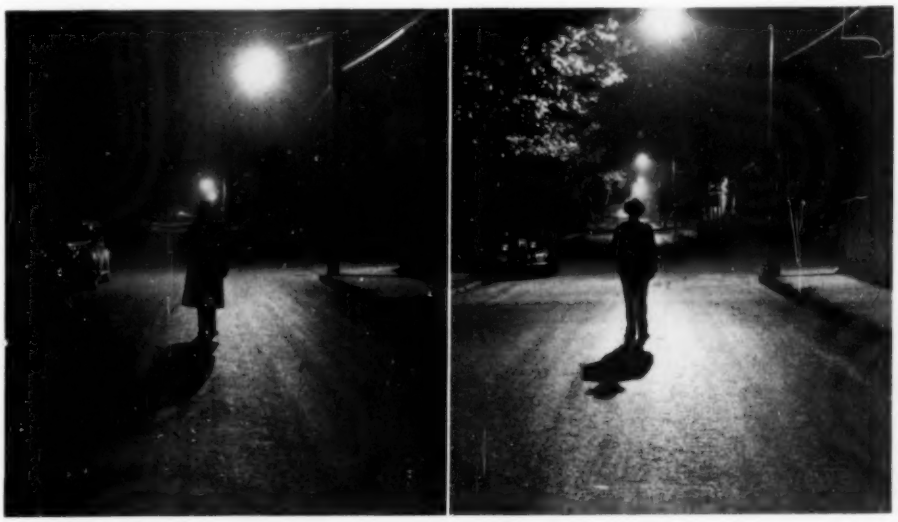
"We may well ask," said the speaker in conclusion, "Has an immature human race stumbled upon a dangerous toy? Are we children playing with a loaded gun? Shall we grow up in wisdom before tragedy engulfs us? Is this the riddle of the Sphinx, to fail in which means destruction? Or may we perhaps look forward to an era of an awakening in wisdom, commensurate with the rocket-like ascent in knowledge? Should this come about, then Utopia, from a dream, would become a real presence."

Not Childless by Choice

DESPITE spread of birth control practices, childless women do not remain permanently without offspring through their own choice. Even though they may have used contraceptive methods to postpone the arrival of children, through prudence or necessity, they have no wish to deny themselves motherhood altogether.

This was stressed in a paper presented by Clyde V. Kiser of the Milbank Memorial Fund technical staff. Mr. Kiser obtained statements from 291 childless women who had been married ten years and were less than 40 years old when married.

Among these, three-fourths stated that they had never used birth control methods at all, and only 14 per cent. had used such methods regularly and constantly. Furthermore, approximately two-thirds of the group stated that their failure to have babies had been a disappointment to them, and 57 per cent. stated that they had actually consulted physicians to learn the cause of their childless condition.



BEFORE AND— AFTER

The pedestrian in the picture on the right shows up clear and sharp in the motorist's view. He is no longer lost in shadows as in the picture on the left. This new lighting system is adding to the safety of Greensburg, Pa., called "best lighted" by Westinghouse who took the photographs.

Birth Control Motives

BETTER understanding of the motives impelling potential parents to deny themselves children through birth control methods must be obtained if population management is ever to be seriously attempted with any hope of success, declared Dr. Warren S. Thompson, director of the Scripps Foundation for Research in Population Problems, at Miami University.

"If the economic motive is the chief motive leading to the practice of contraception, it must be distinguished from necessity since the birth rate appears to be lowest in the comfortable and well-to-do classes," Dr. Thompson pointed out. "If the time should come when the community would like to exercise control over the birth rate, it cannot do so intelligently unless the motives which actually lead to the practice of contraception have been studied carefully.

"Until it is clearly known why such a large proportion of the population prefers families too small to insure reproduction, it will not be possible to take measures to change this situation if it is desired to do so.

Dr. Thompson stated that he expected the high birth rate in industrially backward countries like China to continue high, and expressed the opinion that efforts to increase the birth rate in certain European countries apparently are having some effect.

Fewer Widows Nowadays

MEN and women marrying nowadays can do so with better assurance than their parents and grandparents had, of not being left mateless before their time, Mortimer Spiegelman of the Metropolitan Life Insurance Company's statistical bureau told the meeting.

"The general improvement in mortality in the last century has resulted in an appreciable reduction in the chances of widowhood for both man and wife," said Mr. Spiegelman. "A married man under age 50 today is less than half as likely to lose his wife by death in the course of the year than he would have been one hundred years back; for wives, a corresponding benefit of the same magnitude extends only up to age 40.

"Since the family is the social unit through which the growth of the population may be influenced, the notable reduction in the chances of widowhood at the young ages of married life, apart from other factors, has, to some extent, enlarged the potentialities for population increase."

Farm Birth Rate Falls

BIRTH rates have long been notoriously lower in industrial urban areas than in the country. But even in the country there is a differential between the prosperous, money-crop type of farming and the poorer, less well organized type of agriculture where people raise a larger proportion of their produce for their own direct consumption.

The more prosperous commercial farmers tend to have fewer children, stated Conrad Taeuber, agricultural economist of the U. S. Department of Agriculture. In general, the farm population shows the same kind of inverse relationship between prosperity and birth rate that is found elsewhere: the poorer the parents the more children they have. Negroes have larger families than whites; poverty-stricken white farmers in the arid West have more children than prosperous white farmers in the East.

Science News Letter, November 26, 1938

SOCIOLOGY

Marihuana Smoking Seen As Epidemic Among the Idle

Morals Lowered by Drug Which Induces Unpremeditated Acts of Violence; Does Not Improve Playing of Swing

THE ancient Oriental vice of marihuana smoking has swept over this country and Russia like an epidemic, leaving a trail of murders and other crimes, child-addicts and heroin addicts and reaching a stage where drastic measures are now needed to eradicate it.

A striking picture of the grave situation, ranging from early European experiments with hashish of the "Count of Monte Cristo" variety, to the case of a youth in Tampa, Fla., who while under the influence of marihuana massacred his entire family, is given by Prof. Robert P. Walton of the University of Mississippi School of Medicine, in his book, *Marihuana: America's New Drug Problem.*

"Swing" band players, of whom large numbers are said to use marihuana, are all wrong if they think it improves their playing, Prof. Walton points out. They may think they are playing better when they use marihuana, because the drug increases sensitivity to sound, gives a keener appreciation of rhythm and timing, and releases inhibitions. Judged by objectively critical means, however, "the standards of the performance are no doubt lowered," Prof. Walton says, adding that most serious orchestra leaders agree with this opinion.

Temperament, social conditions and intimate contact with other marihuana addicts are the chief factors in the spread of the vice, according to Prof. Walton. The Kentucky pioneers, he points out, cultivated hundreds of tons of hemp, from which are made marihuana cigarettes, also known as "reefers" and "muggles," without, so far as the records show, indulging in the use of marihuana.

By contrast Prof. Walton sees the custom of marihuana indulgence "expanding among the idle and irresponsible classes of America and Russia" as it has maintained itself for centuries "among the more dissolute populations of the East."

Very few deaths have resulted from marihuana indulgence.

Among the serious aspects of the situation are the unpremeditated acts of violence resulting from loss of complete control of judgment and restraint while under the influence of marihuana; general lowering of morals and restraint following continued use "of this vicious dissipation"; increase in premeditated burglaries, hold-ups and other crimes as a result of a bolstering of courage by use of the drug.

Science News Letter, November 26, 1938

● Earth Trembles

Information collected by Science Service from seismological observatories and relayed to the U. S. Coast and Geodetic Survey resulted in the location of the following preliminary epicenter:

Wednesday, Nov. 16, 10:54.6 p. m., E.S.T.

An aftershock of Alaskan earthquake of Nov. 10. Latitude 55 degrees north, longitude 158 degrees west.

For stations cooperating with Science Service in reporting earthquakes recorded on their seismographs see SNL May 21.

PHYSICS

Brilliant Italian Scientist Wins Nobel Prize in Physics

Discoverer of Elements Heavier Than Any Known Before He Has Also Found That Over 40 Are Radioactive

ITALY'S outstanding atom-smashing scientist and theoretical physicist, Prof. Enrico Fermi of the Institute of Physics at the Royal University is the 1938 winner of the Nobel Prize in Physics.

Born on Sept. 29, 1901, Prof. Fermi has won fame in both experimental and theoretical fields of research.

He was the first man to predict and determine experimentally that the bombardment of elements by neutrons would cause transmutation of the elements. Working quietly at Rome, Prof. Fermi was able, within six months after the discovery of artificial radioactivity by the Curie-Joliots, to study the bombardment of over 60 elements with neutrons. Out of this number he found more than 40 to exhibit radioactivity.

Prof. Fermi was also the first scientist to show that the capture of neutrons could be facilitated by water and by making them travel at low speeds. These "slow" neutrons are now a valuable research tool in the field of nuclear physics.

In theoretical physics Prof. Fermi is best known for his development of the so-called Fermi-Dirac statistics, a mathematical method of dealing with the problems encountered in predicting atomic structure and behavior.

In mathematical physics, too, he developed a hypothesis known as the Fermi theory of beta-ray decay which attempted to fit the atomic particle, the neutrino, into the still baffling problem of the liberation of the beta rays (electrons) from radioactive materials. While this theory is far from correct it is still the only one, of the many suggested, which appears to have a semblance of plausibility.

During his intensive research on the bombardment of many elements with neutrons Prof. Fermi used uranium as a target. He was able to make the neutrons stick in the nuclei of the uranium atoms and create super-heavy elements.

At first the scientific world was amazed and skeptical that Prof. Fermi had been able to create an element, No. 93, heavier than the heaviest of all known elements, uranium, No. 92.

However, the discovery was amply confirmed and it has since been found that science can create artificially elements still heavier, Nos. 94 and 95.

Through his atomic experiments Prof. Fermi was able to show that the ability of the nuclei of atoms to capture neutrons was far larger than had been supposed. There appear to be conditions of resonance in the nucleus which aid in this unsuspected capture.

Co-workers with Prof. Fermi at Rome have been a group of scientists whose names should not be forgotten. They are Drs. E. Amaldi, F. Rassetti, E. Segré and B. Pontecorvo.

Science News Letter, November 26, 1938

PROFESSOR ENRICO FERMI

GENETICS

Bearers of Heredity Called World's Most Precious Stuff

WHAT is the most precious material in the world? Gold? Platinum? Radium? Rare precious jewels?

Gold is mere cheap stuff, even at its higher price in effect since 1933, compared with radium, which is something like $21,000 a gram nowadays. And it is quite possible that some of the rare jewels might surpass radium's value, weight for weight.

Suppose we be generous and agree that $100,000 a gram, which is about a thirtieth of an ounce, is just about top value for any such stuff. Investigation shows that any such material is almost valueless in comparison with the minute chromosomes, within germ cells, from which each of us began life.

Since the turn of the century when Mendel's laws of heredity were rediscovered, the secrets of the mechanism of passing life from one generation on to another have been discovered in an amazing exploration into the submicroscopic depths within the cells.

Principal actors in the beginning of life are the two sets of chromosomes, one male, the other female, that come together. This hereditary material is almost inconceivably minute.

If all the first cells of the two billion inhabitants of the earth could be assembled and their chromosomes weighed, calculations by Prof. A. V. Hill, British Nobelist, show that the total would be found to weigh less than a single drop of water or less than an ordinary sized pin. Thus, observed Dr. Albert F. Blakeslee, Carnegie Institution of Washington geneticist, all the future developments of the human race are contained in chromosomes that weigh about 80 milligrams, about a twelfth of a gram. How can a money evaluation be placed on this material?

What is all the human life in the world worth? A thousand, a hundred or just a dollar per person? At one dollar, which is low enough, the human chromosomes from which we sprang are valued at the rate of $24,000,000,000 per gram.

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SURGERY

Machine Age Is Also The Age of Surgery

THE machine age might also be called the surgical age, judging by the increase in numbers of surgical operations in the present century. In the U. S. Army and Navy, for instance, the number of operations per 1,000 men is about twice what it was in 1910. For the general population, the annual number of operations performed per 1,000 persons is now 65, Selwyn D. Collins of the U. S. Public Health Service found in a survey of nearly 9,000 families in 130 localities in 18 states.

The increase in number of operations, of course, is due to the discoveries, during the middle of the last century, of anesthesia and antisepsis and asepsis. The first discovery made it possible for surgeons to undertake many more as well as more complicated operations because the patient could be spared all pain. Before anesthesia, operations aside from bone-setting and tooth extractions were desperate, last-resort affairs undertaken only by the bravest surgeons and endured only by the bravest patients.

Antiseptic and aseptic procedures in the operating room added to the safety of surgery and the types of operations surgeons could undertake because it meant the end of often fatal germ-infections following operations.

At the rate of 65 operations per 1,000 persons, Americans undergo more than 8,000,000 operations each year. Most numerous, constituting nearly one-third of the total in Mr. Selwyn's figures, are removal of tonsils. Setting bones and operations in connection with injuries, types of operations that date back to antiquity, are still among those most frequently performed. Bone-setting ranks second and operations in connection with injuries third in order of frequency. Operations on the female reproductive organs take fourth place and appendicitis operations come fifth.

Science News Letter, November 26, 1938

ENGINEERING

Japan Begins Exploitation Of Aluminum In Manchuria

JAPAN is undertaking the exploitation of aluminum ores discovered in Manchuria, according to *Industrial and Engineering Chemistry*. (Nov. 10)

The Manchurian ores are high in phosphorus content and so must first be refined by a process credited to scientists at the University of Tokyo.

The ore is treated with sulfuric acid, yielding phosphoric acid and aluminum sulfate. The latter is treated with gaseous ammonia at 1,200 degrees Centigrade. Out of the reaction comes ammonium sulfate and aluminum oxide. The reduction of the aluminum oxide to metallic aluminum is accomplished by standard electrolytic methods.

Plans for the development call for the treatment of 15,000 tons of ore annually from which will be obtained 5,100 tons of metallic aluminum (about 11,000,000 pounds).

American aluminum production, in contrast, is nearly 300,000,000 pounds a year.

Science News Letter, November 26, 1938

PSYCHOLOGY—MEDICINE

Brain Wave Studies Helping Against Drug Addiction

Researchers Hope That Electric Signals May Distinguish Habit-Forming From Safer Narcotics

BRAIN wave records are now being used to aid in the fight against the poppy's curse, narcotic drug addiction, states an editorial appearing in the *Journal of the American Medical Association* (Nov. 12).

How the wavy lines traced by electrical impulses generated in the brain may help in this fight is described in a technical report of a nine-year search for a morphine substitute that will relieve pain without making addicts of those who use it.

The full report, published by the U. S. Public Health Service, will shortly be available, the editorial states, for especially interested physicians and other medical scientists. The studies have been conducted by a committee of the division of medical sciences of the National Research Council, headed by Dr. William Charles White.

The non-habit-forming morphine substitute has not yet been found. The many scientists working on the problem, however, are not discouraged, even after nine years of search that included examination of 300 new chemical compounds.

They have proved, for one thing, that by chemical methods they can change morphine so as to develop a substance that comes close to morphine in its ability to relieve pain. This can be done by synthetic methods, building up a new compound that is like morphine but that lacks the phenanthrene nucleus of morphine. Although the phenanthrene nucleus of morphine is not essential for relief of pain, the scientists are inclined to think that it is essential for addiction or habit formation.

It is for testing the addiction or habit-forming properties of possible morphine substitutes that the brain wave records, scientifically termed electro-encephalograms, may be useful. No method, short of the impractical one of giving a new chemical to large groups of non-addicts, has been developed for determining whether or not a drug is habit-forming. This has been one of the stumbling blocks in the research. Other properties of new drugs can be safely determined from studying their effects on animals and on addicts and non-addicts, but not the important property of causing addiction.

Brain wave studies, therefore, have been started at the federal government's narcotic farm at Lexington, Ky. In one instance so far, the brain wave studies showed a difference between morphine and another narcotic drug — codeine. Since codeine is known to be less habit-forming than morphine, the scientists hope they are on the right track and that the brain wave studies will give them a safe tool for testing the habit-forming or addiction liability of pain-relieving drugs.

The ideal morphine substitute, the technical report states, will be a compound which gives relief from pain for five hours or more but which has a "dependence satisfying" action of 30 minutes or less, or better still, none at all. By "defendence satisfying" action is meant ability to prevent abstinence or withdrawal symptoms in a morphine addict who is deprived of the drug.

Physical dependence on morphine is one phase of morphine addiction which can be used as a test for addiction or habit-forming properties of morphine substitutes. If a new compound can satisfy this physical dependence already established in a morphine addict, it is assumed that the new compound itself will cause dependence if given over a period of time, and therefore that it has addiction or habit-forming properties.

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CHEMISTRY

No Nobel Prize Award In Chemistry for 1938

NO NOBEL Prize in Chemistry for the year 1938 will be awarded, it is announced by the Caroline Institute. The prize money of the award, amounting to something over $35,000, will be placed in the general fund of the Nobel award.

Science News Letter, November 26, 1938

ZOOLOGY—PHYSICS

Man Indicted as Killer On Seventy-Two Counts

In 400 Years A Total of 24 Forms Have Been Wiped Out in North America; Islands Suffer Most

MAN as murderer of his fellow-mammals was indicted on 72 counts before the meeting of the American Philosophical Society, by Dr. Francis Harper of the American Committee for Wildlife Protection.

Since the beginning of the Christian era, Dr. Harper declared, some 72 species and subspecies of mammals all over the world have become extinct, primarily through human agency. The North American record is especially bad: in slightly over 400 years 24 forms, exactly a third of Dr. Harper's list, have been wiped out. Contrast with the relatively sparsely settled continent of South America is marked: the extinction record there stands at zero.

Island faunas suffer especially, the speaker pointed out. The animals on their limited areas, with nowhere to escape to, are particularly vulnerable to attack or competition by man and by certain mammal pests introduced by man. Thus it has come to pass that such small island groups as the Galapagos and the Falklands have lost a species or two apiece, while the West Indies have seen 13 species disappear.

More Idea Than Particle

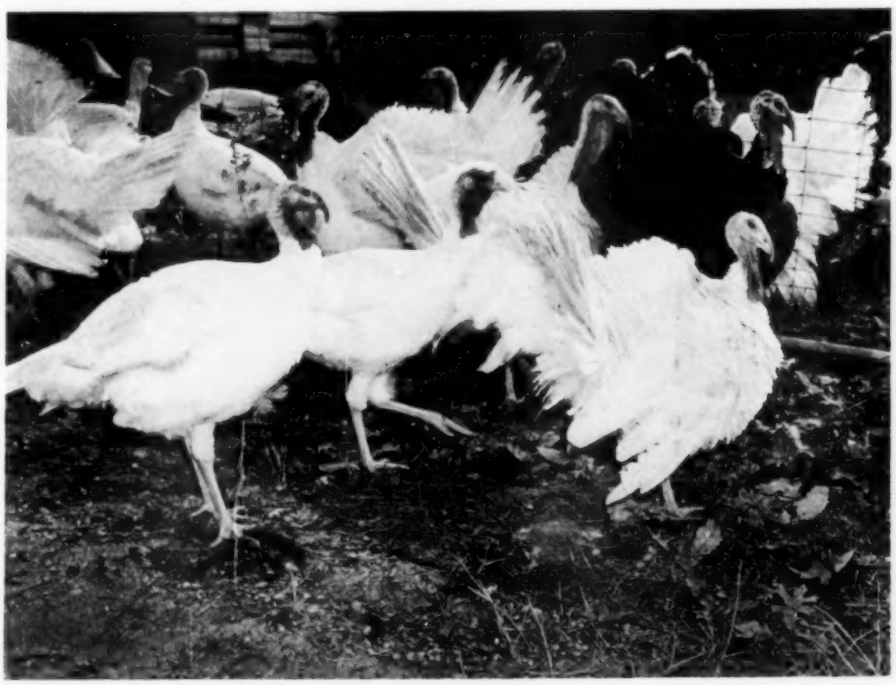
THE heavy electron—for which the name mesotron has now been suggested—is as yet more of a concept of the mind than it is a definite atomic particle, it was indicated by Dr. Karl K. Darrow of the Bell Telephone Laboratories.

Electrons, protons and alpha-particles have had their electrical charges and their change of mass ratios determined directly, but the electrical charge and the mass of heavy electrons cannot yet be measured, Dr. Darrow emphasized.

Thus the definition of what is a mesotron, is based on secondary qualities. When a physicist speaks about a heavy electron he is not referring to a particle whose charge and mass have been measured. Rather he is talking about a particle which has the ability to penetrate a great thickness of heavy metal much more easily than current theories of the electron predict.

Or he may be speaking of a particle which gives an ionizing power that differs not only in theory, but also from previous observations of the ionizing power of ordinary electrons.

In effect, said Dr. Darrow, the physicists have been encountering a series of baffling phenomena which could be explained if there existed a particle having the charge of an electron but having a mass several hundred times greater, and yet less than the mass of the proton. If it should finally turn out that the concept of the heavy electron would serve for all of these bafflements, then the new particle will be established as a feature of modern physics.



HOLIDAY PARADE

If you have a small family you may welcome these small turkeys bred especially for your own table.

Fish Influenced by CO_2

FISH are influenced in their choice of places to live by the relative amounts of carbon dioxide dissolved in the water, it was stated by Dr. Laurence Irving of Swarthmore College. This gas, waste product of the respiration of animals and plants, renders fish much more sensitive to lack of oxygen when too much of it is present. Some fish are much more sensitive to it than others: black bass, for example, are more highly CO_2 "conscious" than catfish. The latter therefore can live in water that bass cannot tolerate.

Science News Letter, November 26, 1938

AGRICULTURE

Government Experts Breed Apartment Size Turkeys

See Front Cover

FOR the small family that does not find it practical to stow the giant turkey of Thanksgiving fame into the oven of a kitchenette, experts of the U. S. Department of Agriculture have produced the small size turkey shown on this page and on the front cover of this week's SCIENCE NEWS LETTER.

If you had a turkey that weighed only about seven or eight pounds for your holiday dinner, you had one of these.

The photographs are by Fremont Davis, Science Service staff photographer.

Science News Letter, November 26, 1938

PHYSICS

Mesotron Suggested As Name of New Particle

THE TERM mesotron is suggested as the name of the newest atomic particle—having a mass between that of the electron and the proton—by Nobelist Dr. Carl D. Anderson and Dr. Seth H. Neddermeyer of the California Institute of Technology.

In a letter to the editor of the British science journal *Nature*, the scientists urge the new name instead of the variety of terms now employed.

First known as the "X" particle, the new atomic building block has also been called a dynatron, penetron, barytron, heavy electron and yukon.

While much still needs to be learned about the new particle, Drs. Anderson and Neddermeyer suggest, it has been shown that it has the electrical charge of an electron or proton and a mass intermediate between them.

Therefore they suggest the word mesotron (intermediate particle) as the new name. They feel sure that no matter what will hereafter be learned about it the name will be descriptive of the in-between mass property.

Science News Letter, November 26, 1938

PHYSICS

Fire Produced From Sunlight and Water

MOSES, you will recall, amazed his followers by striking a rock and having water gush forth. More amazed would his followers have been if Moses had then snatched some light from a sunbeam and made it turn the water into a flame that would burn as long as there was water to feed it.

Substitute Mohr for Moses in this sequel to the Biblical tale and you can bring the story up to date for at Concord, California, Otto H. Mohr is really using sunlight and water to produce a flame.

No miracle or stunt is inventor Mohr's device. He passes electricity through water, decomposes it into hydrogen and oxygen gas and then burns the hydrogen. His electricity Mr. Mohr obtains by focussing sunlight on thermocouple junctions.

The "hot" junctions of the thermo elements are enclosed in a vacuum while the "cold" junctions have little vanes attached to them so that they can radiate heat to the air. Thus, no matter what the temperature is, there is always the necessary heat difference between the two junctions to produce electricity by the thermoelectric effect.

Out of each gallon of water decomposed Mr. Mohr can obtain 175 cubic feet of hydrogen gas, according to the technical journal, *Refrigerating Engineering*. He now has in operation a small sun ray plant that can be carted in a wheelbarrow, which can decompose 1.5 gallons of water a day. A plant twice this size, Mr. Mohr estimates, would supply the needs of a family using gas for cooking, water heating and refrigeration. A water-sealed storage tank would supply hydrogen on sunless days.

Experts on solar energy see the Mohr device as one of small efficiency as compared with several methods which have been used to change solar energy into a more useful form. They agree however that the small flame produced would be sufficient to run a gas type of mechanical refrigerator.

Science News Letter, November 26, 1938

ARCHAEOLOGY

Ancient Byzantine Emperor Made Good Use of Eclipse

C. SULPITIUS GALLUS, quick-witted Roman general of ancient times who warned his men before they went into battle of an impending eclipse of the sun and thus calmed them while their foes were terrified, has plenty of company in ancient history.

The Byzantine emperor, Alexius I. Comnenus, who figures prominently in the First Crusade, also took advantage of superior astronomical knowledge of one of his advisers to outsmart a foe, according to W. A. Osborne of the University of Melbourne, (*Nature*, Nov. 5) He quotes a biography of the emperor:

"In the course of the discussion a certain Nicolas, one of the Emperor's secretaries, came up to him and whispered in his ear, 'You may expect an eclipse of the sun to take place today' . . . . Then the Emperor, with his habitual quick-wittedness, turned to the Scythians and said, 'I appoint God as a Judge; and if a sign appears in the heavens this day, you will know for a surety that I have good reason for suspecting, and therefore not receiving, your embassy because your leaders are not sincere in their overtures for peace. If, however, no sign appears I shall stand convicted of having been wrong in my surmise.' Before two hours had passed the light of the sun failed and the whole disk was darkened by the moon's passing over it. At that sight the Scythians were terrified."

Science News Letter, November 26, 1938

IN SCIENC

ENGINEERING

Ancient Mud Bricks Better Than Modern Baked Ones

MUD bricks mixed with straw, such as have been used for thousands of years in Egypt and Mesopotamia, have been proven superior to modern baked bricks as heat insulators, it is reported by M. K. Nahas and F. H. Constable of the Heat Transmission Research Laboratory at Giza, Egypt. (*Nature*, Nov. 5)

The experiments also showed that when the ancient Egyptian taskmasters oppressed the Children of Israel by forcing them to find their own straw, they were cheating themselves. For under those circumstances naturally the toilers would put in just enough straw to make the bricks stick together; and it was found in the tests that bricks with normal straw content transmitted less than half as much heat as did similar bricks with minimum straw.

Science News Letter, November 26, 1938

ARCHAEOLOGY

Prehistoric Fireplace Dates From About 1700 B.C.

BACK in the days when Joseph was Prime Minister of Egypt, a party of unknown savages beached their canoes on the gravelly shore of an island in Lake Huron and held a barbecue feast. After they had eaten their fill of meat and fish, they paddled on.

Evidence of that forgotten feast has been dug up by Dr. Emerson F. Greenman of the University of Michigan, working in cooperation with the Canadian National Museum at Ottawa. In the gravels of an old beach terrace on Grand Cloche island he has found a charred area three feet in diameter, the remains of an old Indian fireplace. Nearby were bones of fish, beaver, elk and deer, as well as flint chips.

Examination of all available recent geological evidence has convinced Dr. Greenman that the lake level stood at the height of this ancient beach, 28 feet above the present water line, at least 1100 years ago, and probably as early as 1700 B. C. Since that time the water has receded to its present level.

Science News Letter, November 26, 1938

ICE FIELDS

GEOLOGY

Geological Research Continues In China

WAR and invasion have caused severe disturbances in the work of the National Geological Survey of China, but in spite of all handicaps the scientists are carrying on. (*Science*, Nov. 11)

Despite the tremendous losses of books, specimens and apparatus necessitated by several changes of headquarters, the working staff has actually been increased and the work expanded. Intensive study is being given to the economic geology and mineral resources of the southeastern provinces.

Science News Letter, November 26, 1938

ARCHAEOLOGY

Trace Strange Career Of Hercules Myth

HERCULES, world-famous strong man, is being investigated, scientifically.

Familiar to school children as the mythical hero who performed twelve wonder tasks, Hercules intrigues scholars because he has had such a long and varied career in the minds of men.

Far from being an invention of Greek story-tellers, Hercules can be traced back to about 2500 B.C. He may have been talked of long before that. But in Tell Asmar, Mesopotamia, at any rate, people of 2500 B.C. whispered the story of a hero who slew a seven-headed dragon. Archaeologists have proof: a clay seal bearing a picture of the hero ticking off heads from the dragon at perilously close range, while an assistant obligingly holds the beast down at the rear. Another picture found at Tell Asmar shows the same hero equipped with lion-skin, club, and bow, which traditionally belong to Hercules.

Later, Dorian and Lydian kings claimed Hercules as an ancestor, and several Roman emperors sought to identify themselves with the glamorous hero-god. Not knowing that Hercules was nearly two thousand years old, the Greek world accepted him as the son of the god Zeus and the mortal woman Alcmena, wife of Amphitryon.

A British scientist traces the strong and simple hero in Britain, where, it seems, the Romans introduced Hercules along with their other hero-gods. Hercules can be identified on altars in Roman Britain, and bronze figures of him were popular. A 180-foot giant carved on a cliff in Dorset is pronounced a Hercules with club, and possibly a lion-skin.

This British scientist, Stuart Piggott, writing in Antiquity, points out that Hercules lost dignity and became a stock comic figure in classic drama, and in sixteenth century Italian comedy is found capering as Harlequin. Meanwhile, in European folk legend, Herlechinus became a grim and eery giant, armed with the inevitable club, leading ghostly and demonic bands.

Science News Letter, November 26, 1938

BOTANY

Acenaphthene Found To Double Plant Chromosomes

PLANT cells can be induced to double their chromosome numbers and thereby produce giant offspring and other sudden evolutionary changes by another chemical besides colchicine, with which these changes were first induced by scientists of the Carnegie Institution of Washington. The new compound is known as acenaphthene, and it has been used in Russia by Dr. Dontcho Kostoff of the Academy of Sciences of the USSR.

The compound is not applied in solution, like colchicine, Dr. Kostoff reports. (*Nature*, Oct. 22) The plants are exposed in closed spaces to the effects of its vapor as it comes off from crystals by the process of sublimation or dry evaporation.

Science News Letter, November 26, 1938

ASTRONOMY

Second Largest Telescope Has Reached Completion

COMPLETION of the world's second largest telescope, an 82-inch reflector for the MacDonald Observatory of the University of Texas, was announced by Prof. Otto Struve, astrophysicist of the University of Chicago. Final tests on the giant disk, second only to the 100-inch mirror at Mt. Wilson Observatory, at present still the largest in the world, have been finished, he declared.

Two years were required to grind and polish the mirror. A month was required to cool the glass casting from which the mirror was made to room temperature.

Science News Letter, November 26, 1938

BOTANY

Tobacco Mosaic Virus Localized in Protoplasm

VIRUS of tobacco mosaic is localized in the cytoplasm, or general cell protoplasm, of the plants it afflicts, Dr. Lawrence F. Martin and H. H. McKinney of the U. S. Department of Agriculture state. (*Science*, Nov. 11) They squeezed the watery sap out of cells of tobacco leaves under powerful pressure, and then extracted the cytoplasm separately after chemical treatment. Tests of the two extracts showed the virus to be present in the cytoplasm and not in the cell sap.

Science News Letter, November 26, 1938

PSYCHIATRY

Imaginary Voices May Have Basis In Ear Infection

VOICES heard by the mentally ill may have a real basis in a diseased condition of the ear, examination of 100 persons suffering from auditory hallucinations revealed.

Nearly one out of five of the patients when examined by Dr. Elvin V. Semrad at the Boston Psychopathic Hospital was found to have a toxic type of deafness. These people had very little loss of hearing for the spoken voice and usually did not complain at all of deafness, but audiometer tests showed loss of hearing of high notes at about the top range of the piccolo, one of the first signs of a degenerative process in the ears. In no case was the hearing abnormally acute.

The voices or noises seem very real and external to the patient with this toxic deafness, Dr. Semrad said (*American Journal of Psychiatry*). He will reply to the voice or turn to see where it is coming from. He may even seek protection from the police.

Although most patients are frightened by the experience, some actually enjoy it. One patient heard the voices singing tavern songs very vividly and thoroughly enjoyed them.

Some hear a buzzing which they attribute to motors rather than human voices.

For the patient who is free from toxic deafness, the auditory hallucination is described differently. For him the sound is more personal and more intimately tied up with his own preoccupations. He may not be sure it is a voice and often describes it as possibly a thought rather than a voice.

Science News Letter, November 26, 1938

ASTRONOMY

Winter Skies

Nine Bright Stars Shine in the Heavens on December Evenings; Two Planets Are Also Now Visible

By JAMES STOKLEY

THE EVENING skies of the next month or two are the most brilliant of the year, for nine first magnitude stars shine overhead. And this year the December skies are still further brightened by two planets, which add to the gorgeous display freely available for all every clear night. The accompanying maps show the principal objects that are on view. They show the appearance of the northern and southern skies at 10:00 p. m. on December 1, 9:00 p. m. on the 15th and 8:00 p. m. on the 31st.

Perhaps the southeast is the best place to start your survey. Look first for three stars in a row, which form the belt of Orion the Warrior. Though not of the first magnitude they are easily located. Above them, to the left, is Betelgeuse; below, to the right, is Rigel, both first magnitude and part of the same constellation. Below Betelgeuse is the brightest star in the sky, Sirius, in Canis Major, the great dog. Above, and farther left, is Procyon, of Canis Minor, the lesser dog. Higher than Procyon, still farther to the left, is a pair of stars, Castor and Pollux, of Gemini, the twins. Pollux, the upper, is the brighter member of the pair.

High in the east is Auriga, the charioteer, with brilliant Capella. Next, to the right, is Taurus, the Bull, with a v-shaped group, the Hyades, to form the animal's head. In this group is bright and ruddy Aldebaran. Above is a little cluster of stars, the Pleiades, often called the "seven sisters." The remaining first magnitude stars are seen to the northwest. These are Vega, in Lyre, the lyre, which is near the horizon, and Deneb, of Cygnus, the swan.

Jupiter Brightest

All the objects mentioned thus far are stars, that is, distant suns, glowing globes of gas like our sun but millions of times farther away. The planets, however, are bodies like the earth, revolving around the sun, and shining by reflected sunlight. Jupiter is the brighter of the two December evening planets, and even exceeds Sirius, but it is in the constellation of Aquarius, to the west, so there is no danger of confusing the two bodies. At the beginning of the month it remains visible nearly to midnight. The other planet, Saturn, is to the southwest, in Pisces, the fishes. Though considerably fainter than Jupiter, it is as bright as most of the prominent stars. Of the other naked eye planets, Mercury is too near the sun this month to be seen at all, while Mars and Venus, which is far the brighter, appear in the east shortly before sunrise.

Through a telescope, both Castor and Pollux are revealed as multiple stars. That is, they are not single globes, like the sun, but each consists of two or more stars, revolving around their common center. With even a small telescope, one with a three-inch lens, Castor may be seen to consist of two components. Observations made with a spectroscope show that each of these in turn consist of two, while nearby is a fifth star, also revolving with the others, and part of the same system. A moderate sized telescope shows that Pollux consists of three orbs, and there are at least three others shown in more powerful instruments.

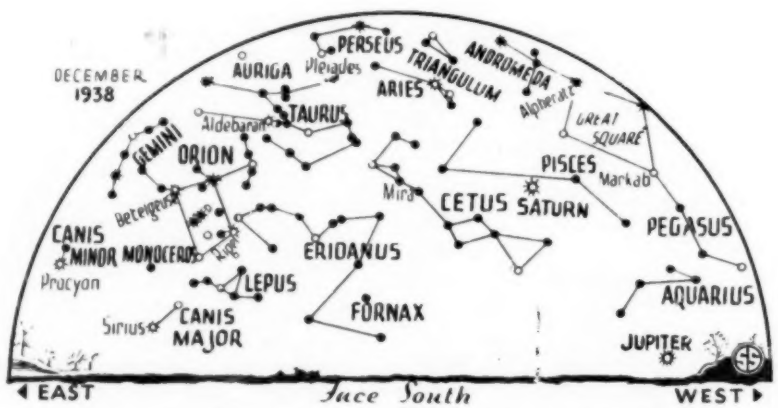
Studied By Herschel

Such multiple stars are not rare, though it is not very usual to find so many components as in these. Probably at least a third of all the stars in the sky are multiple, and of these the binary stars, with two parts, are the most numerous. These were first studied in detail by the great English astronomer, Sir William Herschel, the bicentenary of whose birth we celebrated November 15. He was one of the greatest astronomers who ever lived, and certainly the greatest of amateur astronomers. It is a curious coincidence that the 200th anniversary of his birth is followed, in the next month, by the hundredth anniversary of the birth of one of the greatest of American astronomers, also an amateur, and one who was chiefly known for his work on binary stars, Sherburne Wesley Burnham.

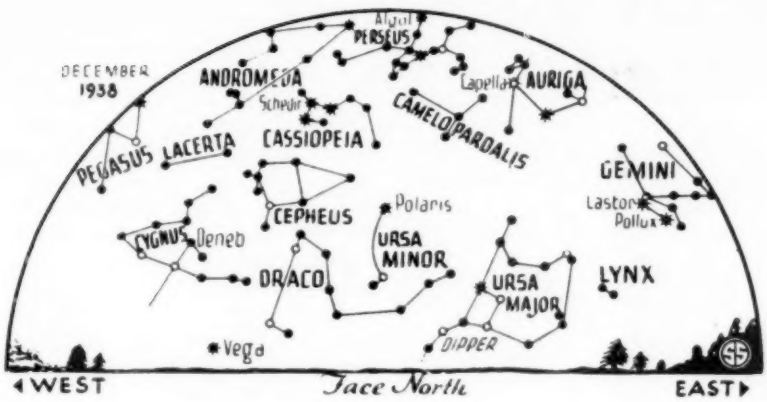
Court Stenographer

Burnham was born in Vermont on December 12, 1838. By profession he was a court stenographer, and from 1892 to 1902 was clerk of the U. S. Circuit Court in Chicago. His first observations were made with a six-inch telescope of his own, and using it he discovered many binary stars that had not been known previously. His later researches were made with the 18-inch telescope of the Dearborn Observatory of Northwestern University, Evanston, Ill., then with the 36-inch of the Lick Observatory, Mt. Hamilton, Calif.; and finally with the 40-inch of the Yerkes Observatory, at Williams Bay, Wisconsin. This instrument is the largest refractor, or lens-equipped telescope, in the world, and is operated by the University of Chicago. With these facilities, he discovered some 1300 new binaries.

The bulk of his work was summarized in a large two-volume catalog of double stars in 1906. This gave all the recorded data up to that time of nearly 14,000 separate pairs, all that were known in



SYMBOLS FOR STARS IN ORDER OF BRIGHTNESS



the part of the sky easily visible from Chicago.

He had retired from his court work in 1902, and in 1913 he retired from scientific work. Then his mantle fell on Dr. Eric Doolittle, of the University of Pennsylvania, who was given all his data. Burnham died on March 11, 1921. But Doolittle had died in 1919, and then the material was turned over to Dr. Robert G. Aitken, now director emeritus of the Lick Observatory, and living in Berkeley, California, where he is continuing the compilation of data. He published, as the joint work of himself and Dr. Doolittle, a new catalog of double stars in 1930, which is the latest authority. However, Dr. Aitken is maintaining a card file on all the recorded binaries, and is keeping it up to date, so there is much new material which has not yet been published. It is, however, made freely available to interested astronomers.

On December 22, at 7:14 a. m., the sun, which has been moving southward since last June, reaches the end of its journey. This is the winter solstice and marks the beginning of winter. On this day the sun rises and sets farthest to the south, and reaches its lowest noon-day height of the year. For this reason, it is above the horizon for the shortest time, and the 22nd is thus the year's shortest day. In the southern hemisphere, however, conditions are reversed. There it is the longest day and the beginning of summer.

Phases of the Moon

		E. S. T.
Full	Dec. 7	5:22 a. m.
Perigee — Distance 224,200 miles	Dec. 8	8:00 p. m.
Last quarter	Dec. 13	8:17 p. m.
New Moon	Dec. 21	1:07 p. m.
Apogee—Distance 252,400 miles	Dec. 24	2:00 p. m.
First quarter	Dec. 29	5:53 p. m.

Science News Letter, November 26, 1938

MEDICINE

Cyclotron Is Now Used In Treatment of Human Cancer

HUMAN cancer sufferers are now being treated for the first time with neutron rays from the 85-ton, atom-smashing cyclotron of the University of California.

Announcement of this use of the cyclotron, which it is hoped will greatly advance the war against cancer, was made by Dr. Ludvig Hektoen, executive director of the National Advisory Cancer Council, adjunct of the U. S. Public Health Service, which has been in the forefront in supplying funds and technical assistance for this newest assault on cancer.

Cancer sufferers throughout the nation are warned not to start for California in the hope of getting treated by the cyclotron. The treatments are purely experimental and no successful outcome can be promised. Only a small group of patients from the University of California's teaching hospital in San Francisco are being treated. The cyclotron's neutron rays have been so effective in treating cancerous growths on small animals that scientists believed this treatment was worth at least a trial on human cancerous growths.

"The success of the neutron ray in animal experimentation does not justify any conclusion that it will be necessarily more successful in treating human beings than X-rays," said Dr. John Lawrence, who, with Dr. Robert S. Stone, chief roentgenologist in the University's hospital in San Francisco, is directing the experiments. "It may be months or even years before any results are known and, until then, we can offer no additional hope to cancer sufferers."

Dr. Lawrence is the brother of Dr. E. O. Lawrence, noted physicist who developed the cyclotron and the neutron ray used on the cancer patients. The neutron rays are created by bombarding a target of a light metal, notably beryllium, with very energetic deuterons, which are the nuclei or ions of heavy hydrogen.

The rays produced by this method were found to have a sharply different effect on biological tissue cells than the X-ray, and it was this difference which led to the present clinical investigations.

Science News Letter, November 26, 1938

PSYCHOLOGY

Strife Created in America By Advancing False Theories

CHARGES that strife is being systematically created in the United States by pressure groups and their conflicting theories of social justice are made by Dr. Henry C. Link, of the Psychological Corporation, in a book, "The Rediscovery of Man" (Macmillan)

"Abstract ideas rather than personal passions, lines of thought rather than bread-lines are pushing this country toward violence," he said.

"Personal tragedy and defeat were once due to the individual's weakness or to physical circumstances beyond his control; today, with untold material advantages, even the most promising person is hamstrung by a formidable array of scientific and pseudo-scientific theories."

IQ tests, Dr. Link says, are a legitimate scientific device whose effectiveness has been curtailed by addition of a theory that undermines the confidence of parents, of children and even of the schools, in the possibility of training a mind. A defeatist attitude is adopted by persons who blame their failures on lack of aptitude, an "inferiority complex" or their glands.

The misconcept of man as a mere victim of forces beyond his control has

been in the making for 300 years, Dr. Link explained. Physics and chemistry provided a mechanistic concept of the universe. Biology repeats much the same story. Astronomy reveals a universe in which man is an infinitesimal dot of little consequence.

"This degrading concept of man reaches its climax in the teachings of our social studies, economics, sociology, political science, anthropology," Dr. Link asserted. "Men and women, these studies assert with confidence, are the victims of their economic environment. They are helpless in the clutches of a soulless economic system."

The assumption that people cannot be led or encouraged to help themselves, therefore they must be taken care of like cattle by some great, automatic social plan is the "foundation for fascism both as it exists abroad and as it is being prepared by the organized social trends in America."

"This definition of man," Dr. Link declared, "psychologists are finding, is not only horribly degrading but fundamentally untrue."

Science News Letter, November 26, 1938

MEDICINE

Nicotinic Acid Hailed For Results in Curing Pellagra

Violently Demented Patients Are Restored to Sanity Within From One to Six Days of This Treatment

DETAILS of the nicotinic acid cure for pellagra, known as the South's hard-times disease because it follows slumps in the cotton market and other economic disasters in Dixie, were related to southern doctors at the meetings of the American Society of Tropical Medicine and the southern branch of the American Public Health Association. They heard how a small daily dose of this acid cures the fiery tongue, the skin rash, the lack of appetite and the dementia of pellagra.

Violently demented pellagra patients were restored to sanity within from one to six days of nicotinic acid treatment, Dr. Tom D. Spies of Cincinnati reported. Associated with Dr. Spies in the pellagra studies are Drs. William Bennett Bean and Jean M. Grant of Cincinnati, Robert E. Stone of Chapel Hill, N. C., and James B. McLester of Birmingham, Ala.

Mentally sick patients whose sickness is not due to pellagra cannot hope to be restored to sanity by nicotinic acid treatment, Dr. Spies emphasized.

A well-balanced diet must be followed along with nicotinic acid in the routine treatment of pellagra, Drs. Julian M. Ruffin and David T. Smith of Duke University School of Medicine, Durham, N. C., told fellow physicians. The Duke University physicians were among the pioneers in the use of this treatment for pellagra.

Pellagra comes from eating a poor diet. Scientists have known this for some years, and have also known that yeast, liver, red meat and fresh vegetables contained the substance necessary to cure or prevent pellagra. The diet of large portions of the South's population was completely lacking in all these foods during periods of hard times. The pellagra preventing substance was at first labelled vitamin B_2. Now, thanks to the work of Dr. C. A. Elvehjem and associates at the University of Wisconsin, it is known that the vitamin which cures pellagra is nicotinic acid.

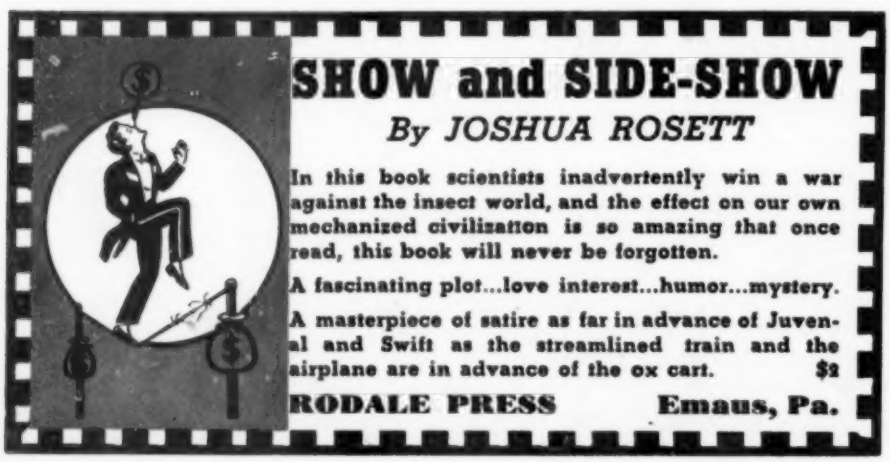
It is not yet known whether nicotinic acid alone will prevent pellagra in persons eating a poor diet. Dr. Spies and associates are giving nicotinic acid to several hundred pellagra patients in Birmingham to find out about this.

Warning against too large doses of nicotinic acid were given by both Dr. Ruffin and Dr. Spies. Normal persons to whom Dr. Ruffin gave large doses of the acid became quite sick with extreme mental depression. Dr. Spies stated that not enough is known of the effects of a super optimal supply of the vitamin to warrant using it "in staple foods or as a national tonic," as has been suggested.

Nicotinic acid does not cure either the peripheral neuritis or the anemia of pellagra patients. These are due to other deficiencies of the diet and need other treatment.

For the neuritis, vitamin B_1, now known as the chemical, thiamin, is needed. This is the anti-beri-beri vitamin. The difficulty in distinguishing nerve damage in pellagra, due to lack of nicotinic acid, from nerve damage due to lack of thiamin was discussed by Dr. George Cheever Shattuck of Harvard Medical School.

This vitamin, Dr. Shattuck pointed out, is widely distributed in nature and is closely associated with the body's utilization of sugars and starches. From these facts he concludes that the effects of deficiency of this vitamin may be "more numerous and widespread in man than has hitherto been recognized." Dr. Shattuck advised caution, however, in drawing sweeping conclusions on the subject and said that vitamin B_1 or thiamin should "certainly not be advertised as a 'cure-all.'"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Body May Starve Invaders

RESISTANCE to infectious diseases may be accomplished in our bodies by a process that starves out the invading organism that causes the infection.

Studies showing this self-starvation process is actually what builds up immunity to a rat ailment similar to hookworm disease, cause of much debility

and economic loss in the South, were reported by Prof. Asa C. Chandler, of the Rice Institute, Houston, Texas.

Prof. Chandler believes that the starvation process may play "an important but hitherto largely unrecognized part" in resistance to bacteria-caused ailments as well as to many worm-caused sicknesses like hookworm disease.

Resistance to bacteria-caused ailments has till now been considered chiefly on the basis of the appearance of antitoxins or antibodies in response to presence in the body of germs that produce toxins or antigens.

Actual resistance to infection, however, is by no means parallel with production of antibodies in the body, Prof. Chandler pointed out. Other forces are presumably at work, of which the starvation process may be the most important. Studies of worm parasites, particularly those of the intestine, show how actual resistance to infection can develop independently of the circulating antibodies.

Prof. Chandler discovered this starvation factor in disease resistance through studies of the way rats develop immunity to an intestinal worm called *Nippostrongylus,* which is distantly related to hookworms.

Science News Letter, November 26, 1938

BIOLOGY

Centenary of Cell Theory Celebrated This Year

BIOLOGISTS the world over have been observing, during the current year, one of the most important anniversaries in the whole history of science: the centenary of the cell theory.

It is difficult nowadays, when everybody, layman as well as biologist, takes cells for granted (even though he may never have squinted through a microscope) to realize that only three generations ago the idea of the importance of these little living bricks of which all living things are built was as new as the sunrise.

Yet so it is. To be sure, cells had been seen before. Early in the seventeenth century, as soon as the first crude microscopes became available, observers saw these objects, either as cavities in the tissues of larger organisms, or singly as "animalcules". But though seen, they were not rightly interpreted.

It was not until 1838 that the right eyes and the right minds were applied to the cellular problem. First came Matthias Jacob Schleiden, son of a Hamburg physician, who at the age of 34

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brilliantly interpreted these minute subdivisions of the plants he studied as the ultimate organized living units. He described with considerable accuracy the course of cell division, and regarded it, correctly, as the essential basis of multiplication and growth.

General application of Schleiden's theory to both plants and animals was made by another German, the zoologist Theodor Schwann, much of whose career was spent in the Belgian universities of Louvain and Liége. He found nucleated cells in the tissues of some of his animals, especially in embryonic tissues, and established the general applicability of the cell theory to all growth and development.

Erik Nordenskiöld declares, in his *History of Biology*: "It is thanks to this theory that the present age has been able to work out its conception of life-phenomena as a connected whole; without Schwann, Darwinism would hardly have been victorious."

Science News Letter, November 26, 1938

DENTISTRY

Caries Cure May be Found In Mouths Free From Decay

LIVES there the man or woman who has no decayed teeth and never has had any? If so, he or she should come forward and volunteer for tests which may lead to the finding of a cure or preventive of that wide-spread ailment, dental caries.

This idea was put forward by Dr. John A. Marshall of the University of California College of Dentistry at the meeting of the Southern California Dental Association.

Persons immune to caries, Dr. Marshall said, have something the rest of us lack. Study of such persons might lead to more rapid progress in the search for causes, cure and prevention of tooth decay.

Science News Letter, November 26, 1938

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GENERAL SCIENCE

Antivivisection Defeat Will Encourage Scientific Work

California passed its intelligence test on health and medicine by defeating by 60,000 votes the so-called humane pound referendum proposition No. 2, one of the 25 proposed laws put before the people on Election Day. This was the bill which threatened to throttle the efforts of California scientists to find ways of preventing or curing such ailments as cancer, infantile paralysis, high blood pressure, leukemia and heart disease. It was attacked by leading scientists as a disguised anti-vivisection measure. (See SNL, Nov. 5.)

By ELLIOTT C. CUTLER, M. D.

Moseley Professor of Surgery Harvard Medical School; Chairman, A. M. A. Committee for Protection of Medical Research.

THE defeat of the so-called humane pound initiative measure in California will encourage all scientific bodies, defenders of biological research, and doctors everywhere to continue their investigations for the betterment of the health of the American people.

The defeat on this bill is a clear indication that the public as a whole believes in defending the frontiers of knowledge and in training doctors in technical methods in surgery through the use of animals.

It is to be hoped that the recent defeat to the misguided sentimentalists in their attempt to embarrass and hinder medical research will lead people to appreciate that the promise of future improvements in public health matters and the discoveries which will better their welfare will largely depend upon the freedom with which scientists may conduct investigations.

Science News Letter, November 26, 1938

MEDICINE

Vienna Medical Faculty Has Lost Half Its Assistants

HALF the assistant professors and instructors on the medical faculty of the University of Vienna at the time Austria was seized by Nazi Germany have lost their positions, it is reported in a survey published by the technical journal, *Science* (Nov. 11)

With a liberal sprinkling of great names whose disappearance from what was once a medical faculty renowned for the ability of its members, the list includes a considerable number of "Aryans" as well as Jews.

Prof. Egon Ranzi, director of the university's surgical clinic, has been forced to relinquish the directorship of the clinic and has been retired on a pension because he had been a supporter of Schuschnigg, according to the journal, which quotes the Berlin correspondent of the *Journal of the American Medical Association*.

Profs. Leopold Arzt and Wilhelm Kerl, both "Aryans" and both ranking dermatologists, have met the same fate and for the same reasons. Prof. Ernest P. Pick, pharmacologist, was forced to retire because he is a Jew. Dr. Arnold Durig, a physiologist, has been retired for reasons unknown. Prof. Otto Lowei, of Graz, Nobel Laureate, has been stripped of his post and was in custody until a short time ago. Psychiatrist Otto Kinders has been dismissed, probably on racial grounds. Sigmund Freud is in London; Hans Hoff, in the United States. Prof. Otto Marburg, noted neurologist, and Erwin Stransky have both lost their posts.

Others who have lost positions are: G. Hitzenberger, radiologist; David Scherf, cardiologist; Julius Bauer, endocrinologist; Karl Glaessner; Otto Porges and Walter Zweig. Prof. Ismar Boas, who had made Vienna his refuge from Germany, committed suicide by taking an overdose of barbital.

The list of those dismissed includes Moriz Oppenheim, dermatologist; Gottwald Schwarz, roentgenologist; Josef

Friedjung, pediatrician; Richard Wagner and Heinrich Kahr, gynecologists; and Emil Froeschels, research phoniatrician. Prof. Heinrich von Neumann, the otologist, a "non-Aryan," was under arrest until the successful intercession of the Duke of Windsor, one of his patients.

Suicides, beside Dr. Boas, include Prof. Wilhelm Knoepfelmacher, pediatrician; Prof. Oskar Frankl, 74-year-old gynecologist; and Gabor Nobl, dermatologist.

Jews were prominent among the instructors and assistant professors, whereas few Jews have held full professorships in recent years. This, the journal points out, accounts for the large number of victims in this group.

Science News Letter, November 26, 1938

ARCHAEOLOGY

Huge Burial Mound of Vanished Race Unearthed

A VAST burial mound and trash heap combined, left by long-vanished immigrants into prehistoric America, has been unearthed on the island of Umnak in the Aleutian Islands, which swing out from Alaska.

Discovery of this evidence of "pre-Aleut" people who presumably came to America from Siberia by crossing the chain of Aleutian Islands, is reported by Dr. Ales Hrdlicka, Smithsonian Institution anthropologist.

Besides skeletons of these unknown "pre-Aleut" people, the mound yielded their bone and stone implements, beautifully made blades of black basalt, curiously decorated harpoon points, and ivory articles. This material is now at the Smithsonian, where Dr. Hrdlicka will study it in order to build a picture of the life of the vanished people.

Volunteer college students, Dr. Hrdlicka said, assisted him in investigating the contents of the mound. Resembling a natural hill, the enormous accumulation of refuse material was hidden in a mound 35 feet high, over 600 feet long, and 250 feet broad.

A search for traces of ancient migration was also made by the expedition in the Commander Islands, which are the far western links in the Aleutian chain, and which swing close to Kamchatka. Finding no trace of ancient relics in these islands. Dr. Hrdlicka concludes that if the Aleutians were a migration trail long ago, the people crossed them by way of the Kurile Islands, or from the north of Kamchatka.

Science News Letter, November 26, 1938

NOMENCLATURE

NATURE RAMBLINGS
by Frank Thone

Borrowed Names

DEEP-seated, ineradicable, seems to be the tendency of people in strange lands to give old names to new things. Thus, in comparatively recent times, have English-speaking people given the names custard-apple, alligator-pear, and grapefruit to tropical products that are neither apple, nor pear, nor grape.

Four and a half centuries ago, when men were looking with excited eyes of wonder on whole new continents, the need for new names apparently ran far ahead of their imaginations. So we have America named for a geographer who did not discover it, and its aboriginal inhabitants named in a mistaken identity with the natives of the lands its real discoverer thought he had found. And the attempt to give the red-men a distinctive title of their own, with the book-name "Amerind," only compounds the felony!

Beasts and birds and plants fare no better. The animal that we continue to call buffalo, in the face of despairing protests by zoologists, is no buffalo. The real buffalo is a quite different kind of cattle, native to tropical Asia and South Africa. Truer is his kinship to the Old-World wisent, so that the variant word "bison" fits him much better. But only the bookish call a bison a bison.

The grotesque misnaming of our wild-fowl as a turkey is of course classic, as is also the misapplication of the name of robin to what is really a reddish-breasted thrush. The pronghorn antelope of our West is no antelope, nor is the mountain goat really a goat.

Plants on the whole have fared no better. When Columbus took back ears of maize with him he took also the native name "mahiz"; and maize the plant remains to the English and (in various close transliterations) to the various tongues of Europe. But we on this continent insist on calling it simply corn, which is the common English term for the small grains generally, and wheat in particular.

Transfers of such names as pumpkin, squash, and beans from Old-World relatives to New-World forms are more excusable, though sometimes the kinship is not too close. The peanut represents more ingenuity than botanical accuracy, for the plant is neither a pea nor a nut; though it must be admitted that it is related to the pea and tastes like a nut.

Yet a few native names have managed to filter through: potato, tomato, tobacco, chocolate; and with these we must perforce be content.

Science News Letter, November 26, 1938

RADIO

Ultra Short Radio Waves Bend Around Earth Surface

THE DREAM of using ultra-short radio waves as secret signalling means during wartime is receiving little encouragement from experiments undertaken at California Institute of Technology, indicating that such waves—believed at first to travel solely in line-of-sight fashion—really can bend around the surface of the earth.

Prof. G. W. Potapenko and Dr. Paul S. Epstein of the Institute have recently completed preliminary studies showing that waves of five meters and one meter length can be picked up at a distance of 18 miles at sea.

Marconi first noted such bending characteristics several years ago. At that time Dr. Epstein formulated a mathematical theory of the bending and, with aid from funds from Carnegie Institution of Washington, he and Prof. Potapenko have built the apparatus needed to carry out the studies.

Science News Letter, November 26, 1938

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History

THE FAR EAST: AN INTERNATIONAL SURVEY—Harold S. Quigley and George H. Blakeslee—*World Peace Foundation,* 353 p., maps, $2.50, paper, 75 c. This volume brings up to date, with the exception of the present Sino-Japanese war, "The Pacific Area: an International Survey," by Prof. Blakeslee, published in 1929. The chief burden of the volume is China's long struggle to defend her sovereignty against Japan (that struggle precedes the war itself), whereas the earlier volume covers China's attempt to abrogate the "unequal treaties."

Science News Letter, November 26, 1938

Physiology

SEXUAL MATURATION AND THE SKELETAL GROWTH OF GIRLS AGE SIX TO NINETEEN—Frank K. Shuttleworth— *Society for Research in Child Development, National Research Council,* 56 p., 75 c. Possibly of interest to endocrinologists as well as to anthropologists and pediatricians.

Science News Letter, November 26, 1938

Population

RESEARCH MEMORANDUM ON MIGRATION DIFFERENTIALS—Dorothy Swaine Thomas—*Social Science Research Council,* 423 p., $2. This study reveals in what ways migrants within the United States differ from the stay-at-homes.

Science News Letter, November 26, 1938

Chemistry

QUANTITATIVE ANALYSIS—Eugene W. Kanning—*Prentice-Hall,* 304 p., $2.75. Quantitative analysis as taught at Indiana University.

Science News Letter, November 26, 1938

Chemistry

EXPLORING THE WONDERS OF CHEMISTRY — Oscar L. Brauer — *American Book Co.,* 230 p., 4 prepared tests, 48 c. A workbook and laboratory guide to accompany *Chemistry and Its Wonders* by the same author.

Science News Letter, November 26, 1938

Mathematics

LA NOTION DE CAPACITÉ—Florin Vasilesco—*Hermann & Cie, Paris, France,* 51 p., 15 fr.

Science News Letter, November 26, 1938

Geology

ARCHITECTURE OF THE EARTH—Reginald Aldworth Daly—*Appleton-Century,* 211 p., $3. An exhaustive study by a leader in the field of dynamic and structural geology. The author expresses himself with clearness and force equally well in his textual exposition and in the diagrams with which he illustrates and reinforces it. The book will be welcomed by teachers of advanced courses and by students carrying on research problems independently.

Science News Letter, November 26, 1938

Journalism

THE DAILY NEWSPAPER AND HIGHER EDUCATION—Rex. F. Harlow—*Stanford Univ. Press,* 44 p., $1. A survey of how school and newspaper can cooperate in their educational mission. Upon a regional basis, through conference and interview, a body of factual information and interpretation has been assembled which should be of interest to those responsible for policy in either field.

Science News Letter, November 26, 1938

Psychology

THE REDISCOVERY OF MAN—Henry C. Link—*Macmillan,* 257 p., $1.75. See page 347.

Science News Letter, November 26, 1938

Ornithology

BIRDS OF THE WORLD—Federal Writers' Project — *Whitman,* 208 p., illus., $1.75. This book justifies itself principally (and abundantly!) by its many excellent, often quite spirited, photographic illustrations, showing all kinds of birds in all kinds of poses. Some are beautiful, some grotesque; all are interesting.

Science News Letter, November 26, 1938

Aeronautics—Meteorology

AERONAUTICAL METEOROLOGY—George F. Taylor—*Pitman,* 429 p., $4.50. A text intended for the airline pilot, dispatcher or for the general student in meteorology. The author is an aeronautical meteorologist with Western Air Express, which flies some of the toughest routes in the United States.

Science News Letter, November 26, 1938

Mining

SIXTEENTH ANNUAL REPORT OF THE SAFETY IN MINES RESEARCH BOARD, INCLUDING A REPORT OF MATTERS DEALT WITH BY THE HEALTH ADVISORY COMMITTEE 1937—Gt. Britain, Mines Department—*British Library of Information,* 136 p., illus., 60 c.

Science News Letter, November 26, 1938

Photography

HOW TO MAKE GOOD MOVIES—*Eastman Kodak Co.,* 230 p., illus., $2. If you are planning to take your own movies here is an excellent book for beginners.

Science News Letter, November 26, 1938

Child Study

THE EFFECT OF PRAISE AND COMPETITION ON THE PERSISTING BEHAVIOR OF KINDERGARTEN CHILDREN—Theta Holmes Wolf—*Univ. of Minn.,* 138 p., $2. The author concludes that "persisting behavior and the effect of incentives upon it are related to very pervasive aspects of personality." The book carries a foreword by Dr. John E. Anderson.

Science News Letter, November 26, 1938

Forestry

LUMBER: ITS MANUFACTURE AND DISTRIBUTION (2nd ed.)—Ralph C. Bryant —*Wiley,* 535 p., $5. A new edition of a work valuable both in the instruction of forestry students and for general reference.

Science News Letter, November 26, 1938

Physics—Chemistry

A COURSE IN CHEMICAL SPECTROSCOPY—H. W. Thompson—*Oxford,* 86 p., $2.25. The text used in connection with the course on spectroscopy recently introduced at Oxford University for under-graduate students about to come up for their final examinations in chemistry.

Science News Letter, November 26, 1938

Zoology

TRAINING YOUR DOG — Carl Spitz — *Marshall Jones,* 234 p., illus., $2.50. If you want to teach your dog to be a hunter, a watchdog, or other kind of working animal; if you want to teach him tricks; if you only want to teach him good manners and break him of bad habits, this is the book for you.

Science News Letter, November 26, 1938

Natural History—Bibliography

KEY TO THE OUT-OF-DOORS, A Bibliography of Nature Books and Materials —Richard James Hurley, comp.—*Wilson,* 256 p., $2.50. This book should be invaluable to teachers, librarians, club leaders, and all who have to do with nature education. Listed are not only books and pamphlets, but also charts, films, lantern slides, apparatus and supplies.

Science News Letter, November 26, 1938

Sociology

MARIHUANA, AMERICA'S NEW DRUG PROBLEM—Robert P. Walton—*Lippincott,* 223 p., $3. See page 340.

Science News Letter, November 26, 1938

Physics

THE STRUCTURE OF ALLOYS—W. L. Bragg—*Oxford,* 7 p., 40 c.

Science News Letter, November 26, 1938